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WHERE AM I? ONLY MY ACCESS MANAGER KNOWS FOR SURE

At a time when fashionable people are building file managers and operating system shells that display everything as cute icons, a number of vendors are eschewing fashion for true usefulness, acknowledging that computer-naive users may yet be sophisticates in daily life, with established behavior patterns marketers should pay attention to. Icons are handy, but when you have to remember 10 or 20 different ones, each a centimeter or so square, you may conclude that icons aren't the answer. Likewise, even a three-letter extension clearly indicates what kind of file something is; but the issue is which one in particular it is: The budget or the marketing plan? The angry letter or the soothing follow-up sent the next day? Oh, to have a neat set of file cabinets arranged by project, not by application! Oh, to be able to riffle through a sheaf of papers in a folder! Oh, to have the system find it and hand it to you before you even ask!

These capabilities are provided in a new category of software that we call access managers for want of a better name. Alternative names include smart DOS, OS/2-envy-alleviator, content-based file manager or environment manager (since file manager is already taken, for single-file databases). But none is satisfactory -- and of course, if any name were obvious the products would have been here long ago. They include Traveling Software's ViewLink, shipping now for $149.95; Lotus Magellan, shipping in a couple of months for $139 (rising to $195 in July); and Brightbill-Roberts' HyperPAD, shipping this quarter for $99.95.

As people spend more and more of their lives on computers, the old DOS ways of organizing their lives won't suffice. Calendars, memos, budgets, different sets of people don't all look alike and don't all sit in one place in real life, and neither should they in electronic life. Finding things all from one point is handy; having them all look and behave the same is inefficient and counterintuitive.

Technically, access managers are part of a progression towards the installable file systems that future versions of OS/2 will support. Commercially, they're part of a progression towards ease-of-access that began before DOS and has continued through DOS shells such as Norton ⟹

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Commander and XTree, which allow users to catalogue and manipulate their files by more than their given DOS names. Their techniques vary from adding power to DOS to employing file-independent text-search and indexing capabilities that bypass rather than use DOS. Separately, there's the notion of large-grained objects -- data files that exist from the user's perspective with their applications attached, as on the Mac or H-P's NewWave: Load a file and its application comes with it. (What to do when a single file can be used by multiple applications? There are a variety of conventions for handling that problem.)

So what do these access managers actually do? In the end, they give users a convenient way to get at their work. Yes, their *work* -- not their files and applications, but their work. They can deal with it either in groups -- moving objects from folder to folder, grouping them, linking them, deleting them -- or with a couple of objects at a time, looking inside them to see what's there, pulling pieces together, taking snippets from one to another.

Positioning: From demographics to psychographics

These products are all targeted at DOS users, and perform a generic set of tasks. Yet they can be pretty easily positioned against each other -- not by power or configuration (although you need some extra hard disk space for Magellan) -- but by user personality. While this may sound strange now, it makes perfect sense.

As its users move from concern with files and programs to concentration on content and tasks, application software will increasingly need to reflect users' habits of thought. On some level, we've seen that segmentation already, as expressed in the kinds of users who buy Macs versus those who buy PCs. But that is rarely a personal decision; it more often reflects (victory over) corporate policy or the presence of graphics-intensive tasks. The choice of access manager, while it may be dictated by a company, is more likely to be left up to the individual -- and it is fairly independent of costs, hardware choice and applications. All run on networks. All have a memory-resident mode. They work on top of DOS, with a little kernel left when you enter an application.

ViewLink is for the user who focuses on a number of well-defined but separate tasks, and leads a fairly orderly electronic life. There are certain files he frequently uses together. **Magellan**, by contrast, is more suited to the person who does lots of different things, out of sequence, and never stops to organize them. **ViewLink** makes the user do a little work upfront to set up a comfortable arrangement of files and applications; **Magellan** does more work itself (because the user does less), and it does it over and over again, with variations most times. Finally, there's the **HyperPAD** end-user, who has things organized for him, and the **HyperPAD** builder/user, who organizes environments and access paths for others.

The next time you go to a party, you may use this opener with our compliments: "So, are you a Magellan or a ViewLink kind of guy?" If the person is an organization person who answers, "Neither, I use HyperPAD," ask: "Do you use HyperPAD yourself, or does someone do it for you?" Along the same lines, someday people will say meaningfully, "Oh, Juan's an Agenda user!" or "I bet Alice uses The Coordinator to communicate with her husband."

LOTUS MAGELLAN

Magellan was designed and built by Bill Gross, the creator of Hal, the richest domain-specific natural-language tool we know of (see **Release 1.0**, 85-12). Lotus acquired Hal and Bill and Larry Gross's company GNP in 1986, and kept them on board by letting them tinker. Bill Gross came up with startlingly fast algorithms for string-search and indexing and relevance rankings, and thought he had a wonderful text-search program. That was a year ago.

However, he still found it annoying that finding the strings was much easier than displaying them in context, and began to fool around with mini-applications ("viewers") that could display application files as they looked in full dress. He did this carefully, without looking at the relevant source code, to avoid legal problems. Next came an interface to make the program usable by anyone, with facilities for launching applications, copying, moving and printing files, and other enhancements.

The result is a powerful access manager that allows users to get at their files by DOS file name, or by a smidgen of text that they know is buried in there somewhere. To do so, Magellan executes a query for a certain string or strings across all files or only a subset of particular interest. The results are listed in order of relevance on the left half of the screen; you can flip through them by moving the cursor through the list. The first page of the contents of each file selected appears on the right, much as it would look if you loaded the application. (Executable files still look like gobbledygook.) You can stop to scroll through a whole file or search for a string within it. The product doesn't yet support graphics or color simulations (the equivalent of "Oh yes, it was on that dog-eared pink paper") but it shows enough for most people ("I know it had a reference number in the left corner" or "I could recognize it if I saw the first three items").

Magellan works so fast and with such a small index (about 5 percent) because it simply lists the files in which each word appears (in its own numerical representation, not with a full name) and the approximate location within each file. It divides the files into 256 sections, so that any file location can be specified with only 8 bits. When a file is retrieved, Magellan then uses simple string-matching to find the specified word or words.

Magellan's viewers, of course, are simply applications that use another application's file format, starting with all the Lotus applications, dBASE, WordStar, WordPerfect, MultiMate, DisplayWrite, MS Word, and ASCII, with others (XyWrite, please!) on the way. They can do as little as display and print text and numbers (the Magellan default), or you could build ones to do more interesting things such as filter data, draw graphs from data, pass information from one place to another, or conceivably even translate languages. In an object-oriented environment, you might call them procedures which could be activated to work on a file by the appropriate message from another object. But that's getting ahead of things...

TRAVELING SOFTWARE'S VIEWLINK

ViewLink (nee Papillon) is a different but competing product from a somewhat less-known vendor, Traveling Software. Either product will help you to get at your files, but the fundamental idea behind each is different. Overall, ViewLink is richer as a file manager -- with more ability to group and man-

ipulate files -- than Magellan, but poorer in terms of providing the memory-assisting instant display that makes Magellan so powerful.

Five years in development, ViewLink lets you create virtual views, or collections of files, so that you can cross-reference files and quickly launch applications for any data file chosen. There's no physical movement or changes in the files themselves, so you can put a file in as many views as you wish with no fears of redundancy or version confusion; the file referenced in each view is the same and any changes in it are reflected no matter which view is used to reach it. The ability of views and items (files) to reference each other is reminiscent of Agenda's items and categories, but it lacks the intelligence and automatic, dynamic restructuring capabilities of Agenda, to say nothing of its content-parsing ability.

The point is not to compare ViewLink to Agenda, but to note that it uses some of the same ideas for linking and free-form organization. A contrasting approach (to both ViewLink and Agenda) would be to use a relational database, which would make connections dynamically among data elements, files or items/notes, as the case may be. ViewLink and Agenda give you the ability to establish persistent connections among things regardless of their content or attached labels; Magellan provides dynamic links based on the presence of strings as well as specified attributes. (We expect to see a database-based access manager soon; watch this space.)

The structure of ViewLink isn't as rich or as fine-grained as Agenda's (unless you want to have hundreds of files of a few characters each). On the other hand, these references work *across* files for all applications; they just don't work *within* files with the fineness that Agenda has. Thus, you can link a conference budget in 1-2-3, say, to a selection of other files including a XyWrite name file and the letter to merge it into, a Paradox table of attendees, and a conference schedule, also in XyWrite. With a keystroke, you can call up the set of items linked to the item you're currently using, and load any of them with the appropriate application (automatically saving and closing your current work, until we get the OS/2 version).

HyperPAD: THE ULTIMATE LAUNCHING PAD

If you move along the spectrum from Magellan to ViewLink and beyond, you get to HyperPAD (for Personal Application Designer), the third of this spring's crop of access managers. While the first two give the user direct control over his environment -- whether to set it up in advance or to find things dynamically -- HyperPAD is more likely to be used by a builder/user who will set things up for other users. It's the only one of the three that offers a runtime version -- pricing not yet determined. Some might argue that HyperPAD not an access manager at all, but an access controller. Yet it can also be used out of the box as a simple access manager to launch applications without customization. It all depends on what you do with it.

HyperPAD comes from Brightbill-Roberts, one of those perennial start-ups with a number of fairly successful products (notably Show Partner, with more than half a million copies out, some bundled) which is now making its bid for the bigtime. The company has hired a PR agent and is exploring bundling deals (having been turned down by Microsoft -- see below). Company co-founder and ceo Steve Brightbill's goal is to provide for DOS users what he sees as the major function of HyperCard -- small personal applications (such

as name & address files) and easy access to other applications through automatic launching routines and user-built scripts. (By contrast, Silicon Beach has extended HyperCard's graphical capabilities with SuperCard, a Mac-based product that provides variable-size "cards," color, object-oriented drawing as well as "painting" tools, and some language extensions.)

Of course, Apple had a much easier time than B-R will: It could give HyperCard away for free because it sells the underlying hardware, and the Mac offers a much more unified environment to manage than does DOS. On the other hand, Apple has paved the way for HyperPAD, and HyperPAD has a much larger target market -- any PC/clone with 384k of memory. HyperCard requires a megabyte of memory, whereas Brightbill-Roberts has taken the minimalist approach (as has Tandy with DeskMate) on the theory that low-end users will be most hungry and grateful for this kind of help. Brightbill-Roberts has made the fundamental discovery many people have missed: Wonderful as they are, HyperCard's graphics capabilities are almost beside the point.

Thus HyperPAD is text-based -- and proud of it. (Users are not incapable of *reading*; they're merely incapable of understanding what's going on in the typical DOS environment.) HyperPAD uses a language similar to HyperCard's HyperTalk -- which Apple's Jean-Louis Gassee has publicly proclaimed a standard. This environment-building tool allows a builder/user to create and copy buttons, write little scripts with variables, loops and calls to external routines, and to launch applications with associated data files automatically. An experienced user can also build the equivalent of easy-to-understand batch files to perform common routines such as retrieving mail (including logging on to an external service) and converting numerical data to graphs, with the help of the appropriate third-party applications. Like HyperCard, HyperPAD will probably make inadvertent programmers of people who try it before they have a chance to get frightened. As a programming tool, it takes more work and can do more than the other access managers, but it keeps the user farther from the DOS file system, for better or worse.

Let's get practical

How should these tools be distributed? Technically speaking, they should be part of the operating system, a fact which won't escape Microsoft (and which hasn't escaped Lotus!). Despite its role as a vendor of applications (one of which may be the business's most familiar environment), Lotus has the firepower and, right now, the idle salespeople to mount a credible campaign for Magellan on its own. The company's apparent success with Agenda, certainly a tough describe let alone a tough sell, bodes well for its capability to establish Magellan as a widely used tool.

All this activity is a mixed blessing for Microsoft, whose own DOS-based access manager candidate is Windows. Access managers will extend the life of DOS but will also point up its shortcomings, as Allways does for 1-2-3 and compiler companies did for dBASE. Lotus now bundles Allways, and Ashton-Tate has bought rights to the Frontrunner compiler. We're interested to see what Microsoft will do, especially now that arch-rival Lotus is in the game.

It might do well to purchase distribution rights to ViewLink or HyperPAD; their owners would certainly do well to sell them to Microsoft. Failing that, the companies could try to get credible hardware vendors such as Compaq, Zenith, Dell or AST (Tandy already has DeskMate) to OEM or bundle their

systems. Regardless, ViewLink and HyperPAD should do well for their owners based on sheer quality and power -- and a market publicized but not fully covered by Lotus -- but not as well as they deserve. Overall, with the prospect of OS/2 raising a clamor for improvements to rather than replacement of DOS, prospects look good for life-extender products such as these.

Long run, Microsoft will of course make it easier to offer such facilities with installable file system support in future versions of OS/2 -- and will probably itself offer at least the capabilities of ViewLink and HyperPAD, if not Magellan. We know of a number of vendors working on such products with OS/2. But if other people keep on embellishing DOS with these and other enhancements, Microsoft may wish it had an access manager of its own.

ALL THE OTHER THINGS IN CONTEXT

Here we consider all the tools on the periphery of this category and why they aren't full-fledged access managers (although most of them are something equally valuable in their own right).

AskSam, Info-XL, Lotus Agenda, IZE, GrandView: All of these text or PIM (Personal Information Manager) tools organize, structure and categorize files (called items, notes, whatever). In that sense, they are more powerful than an access manager, and deal with the user's data on a more detailed level than an access manager, which handles DOS files and leaves the details up to the individual applications it supports. However, these text tools deal only with data and files in their own format and referenced DOS files. Although they allow for importing of external data, they don't easily allow users to keep using their data with its original applications. That is, they don't support other applications as much as they "interface" to them. (Note: These are generally single-user tools, while Lotus Notes, related product, will support multiple-user access and manipulation.)

Ashton-Tate TurboSearch, Memory Lane, Microlytics GoFer, Unibase, Verity's Topic, ZyIndex and many others: These tools and many more allow you to search files for particular strings, in defined ranges of proximity, etc. However, they just get the user to the string, and then leave him there, while the access managers take care of loading relevant applications, creation of cross-links and other tasks. Some of them index the whole disk, while others do full-text search at the time of a query; either approach has advantages. Call them file finders rather than managers. (Ashton-Tate's new TurboSearch, moreover, deals only with files explicitly stored in its library and with A-T or ASCII files rather than with arbitrary application files.) Like the text tools, the text-search tools generally operate as applications -- independent or memory-resident add-in applications -- rather than as replacements/extensions for DOS.

Norton Commander, Executive Systems' XTree, World Software Extend-A-Name, SoftLogic's ClassiFILE, Bourbaki's ldir, Microsoft's own DOS 4.0 and a wide selection of DOS shells: These systems generally enhance DOS by creating an auxiliary file that knows much more about each DOS file than DOS itself does. This lets users manipulate and find files much as a file manager (old use of the term) lets them do with data, so that files can be selected by attribute or clumped into groups as in Extend-A-Name's library concept). The better ones allow the user to define attribute fields (such as lengthy

text descriptions, author, date -- much as many word-processor-based document managers do) and can group files by directory, attributes, extensions or other criteria; all of them allow the user to stretch the long-text description field for this purpose. Some of them also provide graphical displays of the volume/directory/subdirectory hierarchy, so that the user can visualize a "map" of his resources. Others offer icons, with folders and various file types distinguished. Most of them also offer group operations, so that a user can deal with sets of files as a group, and overall statistics (space left, bad sectors, etc.). SoftLogic's ClassiFILE also offers the handy ability to look at the first 10 lines of characters in a file, but in most cases it's meaningless strings, as opposed to the elegant displays of Lotus Magellan (for supported applications only, to be sure). Extend-A-Name works within applications, so that you can use it to load files as well as find or manage them.

H-P NewWave: H-P's NewWave lacks the powerful file-manipulation capabilities of the DOS shells above, but shares the access managers' basic understanding that data hardly exists independently of an enabling application. Thus NewWave loads the appropriate application automatically when the user selects some data. Moreover, it carries this approach throughout, so that a user assembling different kinds of data (including ultimately voice and other "exotic" data) gets the behavior along with the data. The downside, of course, is that this works only with NewWave-aware applications.

In spirit, NewWave is closest to HyperPAD, but it has even higher ambitions (and prospects). H-P is already addressing in NewWave issues of distribution of object functionality across a network, support for UNIX and OS/2, and ties with application developers who will make their products NewWave-aware or even NewWave-dependent. H-P's goal is to put NewWave constructs *inside* applications, while for the moment HyperPAD merely puts the user inside the applications and keeps itself outside. While HyperPAD is for individual users (even if it is configured by a builder/user), NewWave is designed for the construction of group applications, where the design center is the group rather than individuals communicating with one another, even if they do so automatically.

Hypertext systems: Hypertext tools let you move around within an environment, but most of them require their *own* environment, which doesn't easily accommodate foreign file types. It's the closed-world syndrome again.

The Mac and HyperCard: The Mac automatically links data files and applications, but it doesn't make anything particularly easy to find. Nor does it provide the virtual multiple-linking capabilities of ViewLink. With HyperCard, of course, a Mac user can get most of the functionality of HyperPAD (which it inspired), with superior graphics to boot. But for the moment the Mac's access capabilities are still closer to DOS (despite the icons) than to the systems described here.

UNIX access managers: Finally, one more thing not qualifying as an access manager is a user interface (toolkit). Indeed, the specific goal of Magellan and ViewLink is to allow you to get into your existing applications, rather than force you to use new (or rewritten) applications, as do NewWave or OS/2-Presentation Manager. HyperPAD is in between.

In this context, there are a few access managers for UNIX files (see **Release 1.0**, 88-11), as opposed to user interface toolkits (see page 9). These include X.desktop from IXI Ltd. of Cambridge, England; the Navigator from ParcPlace Systems; and Directory Shell and soon Looking Glass from Visix, a spin-off from American Management Systems. These are all shells for UNIX itself rather than tools with which to build application interfaces such as Motif or Open Look (which of course have interfaces to UNIX, but not ones that make access particularly easy). Accordingly, they are easy to use and install, but they don't fundamentally change the applications within them; they just make them easier to get to.

X.desktop provides an interface that sits on top of X Window, the now standard way that UNIX systems (including OSF Motif) generally use to manage resources (data files and applications) anywhere across a network. X.desktop allows users to represent their files as icons, and to define their behavior. X.desktop is closest to HyperPAD of the systems above, and will shortly support Motif.

The Navigator is closer to the directory tree systems, with a graphical display of the hierarchical UNIX file system. However, it doesn't provide either the dynamic search or automatic linking of the DOS access managers described above. Directory Shell also offers a tree, but without the nice graphics of The Navigator; Looking Glass, out later this year, will have icons and the like.

The all-singing, all-dancing object-oriented database-based access manager of the future: This is it, folks, but it ain't here yet. It will manage everything -- not just data and applications, but also subroutine and class libraries (so that you can construct new object-oriented applications with ease), system resources such as printers, fax machines, and inference engines, name/address/identity directories so that you can reach any person, company or group member in the world either directly or by transparent access through remote directory services, and other resources. Such systems will proliferate in the Nineties, underlying NewWave, NextStep, the ON Technology environment, future releases of OS/2 and the object-oriented rewrite of UNIX (Sun's Menlo Park project; page 13). They will be easy to configure and would be a handy use for the object-oriented database technology (see **Release 1.0**, 88-12).

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HOW TO WIN THE WINDOW WARS: DECLARE VICTORY

As far as we're concerned, the windows wars can't be won (territory can be held but not conquered). Yet vendors can achieve a measure of victory by declaring they've won and withdrawing from contested territory while consolidating their hold at home. Guerrilla fighting will no doubt continue on new platforms from third-world -- that is, third-tier -- vendors, but the world has aligned itself into a few fairly stable camps.

As promised, at the very end of December the Open Software Foundation announced its choice of user interface for OSF/1, its operating system promised for year-end. Elegantly named Motif, the OSF solution represents a reasonable political and technical compromise: the IBM/Microsoft/Hewlett-Packard window manager and appearance (CXI) and the DECwindows programming interface and technical underpinnings, all on top of the X Window system from the MIT X Consortium. This has the feel of something old, something new, something borrowed, something blue: X Window is old and standard; the bas-relief ("3D") look of extended PM from H-P is new; the DECwindows toolkit is borrowed from DEC; PM itself is at least half blue.

As it happens, the code and the programming interface will be mostly DEC's, but the visible part will be enhanced Presentation Manager. (Oddly, this makes Motif look somewhat like NextStep; the buttons appear to bulge into or out of the screen.) While H-P cares most about the user interface, DEC cares most its programming interface, so this all works out well. In fact, of the major U.S. OSF members, only Apollo has been left out. But OSF may well use Apollo's NCS (Network Computing System) networking and distribution technology in OSF/1, so even that would be taken care of.

OSF will take about six months to complete the integration of these various layers, a job contracted back to H-P and DEC. The necessary work is the integration of the DEC and H-P code, rather than changes to the programming interface that could make things awkward for developers later. OSF has already sent its members "snapshots," preliminary versions of the source code and programming interface, so that they can start integration work right away. This summer they should get the final version, so they can build actual products by year-end. Source code licenses cost $1000 each, and allow a vendor to generate a machine-specific binary version for royalties from $40 to $16 per copy. Runtime royalties range from $10 to $4 per copy. The amount DEC, Microsoft and H-P receive is undisclosed, although we guess DEC walks off with a greater share; the amount includes a fixed fee and varies with revenues, not unit sales, leaving OSF with flexibility on pricing.

Military maneuvers

From the customers' perspective, the impact of this announcement is that more and more of the screen world will look like PM/Motif. For hardware vendors, the beauty of the layered approach is that they can use Motif without using any particular version of UNIX or any particular hardware -- although they have to create the interfaces and compile the Motif source code and bind drivers for their particular OS and hardware environment. ISVs, moreover, will still have to produce packages for a particular machine or set of compatible machines, although porting should be relatively easy.

The choice of the PM look and feel helps OS/2 slightly, by making its regular user interface more of a standard. On the other hand, it will likely

help UNIX more by removing a problematic question: Which interface? If Sun and AT&T are true to their words, they may now decide to adopt Motif as well. The Open Look toolkits are late, and momentum is gathering behind PM. We guess it depends on what UNIX International (page 11) tells them to do.

If DEC adopts Motif and builds its own version on top of VMS, as is likely, that will give DEC hardware users a unified environment. DECwindows crosses most of DEC's current product line (both VMS and Ultrix), but is not available on its new line of pcs except when they are used as X terminals. Motif would unify everything under a PM interface, including PM applications running on OS/2 on the new DEC/Tandy pcs. NeXT remains the only holdout, failing to support even X Window -- although it is using the Mach variant of UNIX for its OS kernel.

We've won! Start coding!

Meanwhile, UNIX International has formally announced itself, a victory for the AT&T camp but not necessarily for Open Look. UI hopes to make an interface announcement by UniForum, and it may or may not be a wholehearted endorsement of Open Look. The obvious alternative is Motif, or some other face-saving UNICized form of Presentation Manager.

To the naked ear, UNIX International sounds just as self-serving as OSF, but it has done one clever thing to encourage genuine end-user input: Each full member (at $500,000 per year) gets to sponsor five associate members for free. The natural candidates are customers, who might be loath to pay even the $25,000 associate's fee. Moreover, UNIX International has pulled off something of a coup by establishing a close, formal relationship with X/Open -- something it could achieve more easily than OSF because it has no pretensions to selecting standards but merely to ratifying them. UNIX International is now X/Open's emissary to AT&T.

As we've said before, products are created by tyrants and visionaries, not by committees. We're sure UNIX International will help AT&T's new UNIX Software Operation create a more acceptable follow-on version of UNIX, but we're not sure that any insanely great developers will want to work on it. Nor would committees approve their approach anyway. As one OSF person soberly explained to us, OSF is trying to select the best of today's technology, not to extend it. (We don't let committees interfere with the development, he explains, only with the selection after the fact.)

Overall, OSF and UNIX International will make UNIX more palatable, and competition between the two will make it better. It will become a widely accepted least common denominator -- and probably indistinguishable to users from OS/2. At least initially, you'll probably see more mini and technical applications on UNIX, and more office automation and personal productivity applications on OS/2. Groupware and AI capabilities will show up in both.

The original: Presentation Manager

Now that Presentation Manager is finally here, so the story goes, OS/2 is complete and developers can get to work. In fact, the truth is quite different: The best part of OS/2 -- its programming, not its user, interface -- has been here all along, and ISVs have already begun building mostly office-oriented applications for it. Examples include SQL Server, Paradox

and Lotus Notes. None of these (save possibly Notes) is the killer app that will ensure OS/2's future (cf. VisiCalc, 1-2-3, PageMaker), but there are some candidates out there that haven't yet publicized their names.

While DOS pretty much owns the PC world (with 10 to 15 percent for the Mac), Presentation Manager will have to compete with a variety of UNIX-based interfaces. Their variety, of course, is a weakness, but it's diminishing. Their common foundation on X Window is a strength. X Window, moreover, is not OS-dependent; for example, it also runs on DEC's VMS operating system.

Presentation Manager is tightly linked to OS/2, a single-user (albeit multitasking) operating system, just as OS/2 is tightly linked to the Intel architecture. That means that it's difficult to use PM, for example, to display on a terminal where OS/2 itself is not running (while X Window can easily be displayed on terminals, in a booming business led by Network Computing Devices, Visual Technology and Acer Counterpoint). Achieving this interoperability is the goal of PMX, the H-P/Microsoft product that will host the PM programming interface (rather than merely its look and feel) on top of X Window. This project will take a couple of years, and will allow developers to keep the interface portion of their code (an increasing proportion) when they move between OS/2 and UNIX. CXI, the foundation of Motif's look and feel, *looks* like PM, but has a totally different programming interface based on the X Window toolkit.

Ultimately, the question is: Is Motif's use of the PM interface a victory for Microsoft, or a sign of dispersion of power? It's all a state of mind.

The role of IBM: The China factor

The biggest swing factor is IBM, which has invested more than $10 million each in both Motif (through the Open Software Foundation) and NextStep. Both systems are outside technology, but NextStep is more proprietary, which may be viewed as a disadvantage by IBM's UNIX forces. (The most significant difference between the IBM and NeXT versions of NextStep, aside from NeXT's multi-media capabilities, is the IBM version's use of X Window. This is a no-brainer move; IBM's support for interoperability with other X systems will easily outweigh any negative performance implications.) Traditionally, IBM casts itself as a leader, selling products and promoting ideas, rightly or not, as leading-edge and a proprietary advantage from IBM. But Nick Donofrio, president of IBM's new Advanced Workstations division (read AIX products), is punctilious about offering standards rather than promoting exciting new (proprietary) technology such as NextStep.

IBM will supply NextStep (after the port is completed this summer), and customers will be free to choose it or Motif. However, mere impartiality would favor Motif, since OSF has so much more firepower. We hope IBM will eventually forgo its even-handed stance and actively promote NextStep, thereby fostering its acceptance and increasing its value. NextStep may also get a boost from a reinvigorated Stepstone, vendor of Objective-C, NextStep's base language. Stepstone has just acquired new management, Gus Klein and K.K. Tan, both formerly with IBM (Klein via a number of start-ups).

It's not that we want NextStep's look to win over Motif's; it's that we want someone to push an object-oriented development environment. In fact, it's a pity that NeXT won't support Motif, because that would eliminate an irrelevant objection to NextStep.

Hewlett-Packard: Exploring the wide beyond

Indeed, most of the discussion above has been about territory...but the issue is harvesting methods -- or the development tools that make the platforms productive. Having found the religion of standards in its UNIX side, IBM seems unwilling to preach hard for anything beyond the standards and is letting the customers decide. The customers, of course, don't want anything new. They just want existing ideas faster, better and cheaper. With OSF and UNIX International acting similarly, the field is wide open for anyone -- such as Steve Jobs or Mitchell Kapor or H-P with NewWave, which lacks only a guru -- who presumes to come in and extend the standard with object-oriented tools and environments. Microsoft promises that it will have an object-oriented environment, too -- with an undetermined amount of help from Hewlett-Packard (more or less, depending on which company you talk to).

It's not that we expect anyone to write 1-2-3 in C++, or build a general ledger with objects -- at least initially. But customers will be able to use these environments to build and run the next generation of software, uniquely malleable modeling/simulation systems that enable users to define and then implement the unique processes and procedures that they understand far better than any outside software developer ever could. What they want from the developer/environment is simply tools and reusable code.

For example, an object-oriented word processor...

What would distinguish an object-oriented word processor? For starters, it would know about words as more than clumps of characters separated by spaces. When we do mail-merge, for example, we sometimes leave spaces after a sentence and sometimes forget them -- which makes for strange-looking letters. Likewise, we end up writing "Dear Mountain View, CA 94303" when someone's address is too long. If we put too much variable matter in one person's letter, it doesn't center right. An object-oriented word processor could address all these problems easily.

An object-oriented word processor could be extended easily to work with other applications which recognize the names you write to, and deal with them as customers with orders or employees with problems. How nice to see all that information displayed as you draft a thank-you letter for a big order or write your assistant's six-month review. In a system that recognized names, for example, we could automatically send copies of our newsletter to each individual we know whose company is mentioned within it: "Dear <Juan>, We thought you'd like to see <Juan's company> mentioned on page <6>..." Now there's a good marketing idea!

It's not that you can't find these capabilities or build them in now, but object-oriented programming will make it easier to do so (if not more efficient; that's why hardware vendors should push object-oriented approaches with vigor).

Moreover, when everything's truly object-oriented, you'll be able to switch from one user interface/access style to another with the click of a mouse, and the Motif/Open Look discussion will be moot. Alice wants pull-down text menus with highlights, selectable by keystroke; Juan wants icons and dialogue boxes. And that's what they shall have. Both interfaces will translate their actions into the same machine language.

Components include an object-oriented language that can manipulate existing applications as well as data and objects (H-P's script language; NeXT's Objective-C or, gaining fast, C++; and Microsoft's promised embedded BASIC). There will also be installable file systems, class libraries, etc. The result will be an environment in which users can think about their tasks and information, while the system worries about applications, files and operating system plumbing.

Sun explores interplanetary space

The specs and content of AT&T's UNIX are now basically in the hands of UNIX International, a cadre of existing UNIX vendors and the various standards groups, with the development work carried out by AT&T's UNIX Software Organization. This virtually ensures the success of UNIX as is -- but provides little direction for its future. That future will be an evolution of the past, with vendor-customers and even some end-users de facto voting for the features it should gain over time.

That's entirely appropriate, and it's what customers want and will pay for without much coaxing. But who voted on the Apple II, the PC, the Macintosh, the NeXT -- or on Sun and UNIX itself? Why were all but one of these (the Mac) from a start-up operation with no vested interest in the past? Once the standards groups come in, products are essentially mature ("ripening rather than blossoming," says Sun's Bill Joy) because the standards keep them from metamorphosing in any fundamental way. In accordance with that philosophy, the Sun/AT&T joint project to develop a follow-on to UNIX has been reconstituted at Sun without AT&T, which will now be busy working on standard extensions to UNIX. This so-called Menlo Park project is now setting up operations in Mountain View to work on the next generation of operating system -- not a new release of UNIX, but the next thing after it. Joy, creator of UNIX BSD 4.2 at Berkeley (the basis of SunOS) is leading the project; advanced UNIX technology director Jim Mitchell is managing it.

Military success requires economic success

As Japan is proving, in the end economic power wins out over military might. The success of UNIX will depend on the success of the systems it runs on, not on the pronouncements of the proponents of its various forms. Despite all the preachifying about compatibility, compatibility is determined not by specs but by testing: Run the software on a target machine and see what happens. Ease or difficulty of porting is of interest to software vendors, but not to most of their customers. They want to know if it works without tweaking. (That's why NetFrame (page 14) spent more than two years on its system architecture -- so that application vendors don't have to *port* their software to NetFrame, but can merely *install and run* it on that system.)

In that context, the world depends heavily on Sun. UNIX will fairly easily attract high-end applications, but its prospects on the desktop depend in large part on Sun's success over the next few years in attracting low-end, imagination-catching applications -- which in turn depends on its ability to make ISVs believe its promises of a large installed base. Sun has the advantage of having created for itself a persistent obstacle course. Although it has been amazingly successful, it has avoided getting comfortable.

NETFRAME SYSTEMS: MAINFRAME ON A STICK

It's hard to find new hardware that's truly exciting, rather than merely faster, smaller or cheaper. Form factor, as in portables, is not fundamental, although it may provide unique utility (as Dynabook hopes to do). In this world of standards, it's difficult to innovate in hardware unless you have the clout and momentum of Sun. So what hardware was exciting enough to lure Enzo Torresi away from his long-time role as vice chairman and co-founder of Businessland? Like many forward-thinking people, he was excited about the prospects for groupware, but he wanted some way to approach the problem from a hardware perspective. Along came NetFrame...

NetFrame also fulfills another man's dream. Carl Amdahl, you might say, was born to build mainframes. (His father Gene built the only persistently successful IBM mainframe clones at the company that bears his last name.) But Carl was born too late: Mainframes just aren't hot anymore. He tried once at Magnuson Systems, and again with his father at Trilogy, but to little avail. Now he is building the modern version: a mainframe on a chip.

What distinguishes a mainframe is not its processing power, or MIPS. Microprocessors long ago exceeded many mainframes in sheer instructions per second. Mainframes are distinguished by their throughput -- their ability to ship data around from file to file and user to user. When pcs came on the scene, they operated with one user and very little data -- basically, as much as the user bothered to type in. Now that has changed. Users download data from all over; store massive text files of letters, memos and junk mail; share and revise documentation, policy manuals and boilerplate online; scan documents and images; and live and record more and more of their daily lives electronically. Soon, software will monitor and guide all these activities, creating additional records of its own.[1]

All this activity and the corresponding data movements require more than a cute little pc file-server. In fact, they require more than a power-packed 386 or RISC chip or even a mainframe on a PC bus. They require a server with more throughput than the current range of microprocessor-based systems -- but they require a microprocessor-based system for compatibility (a.k.a. software availability), cost, and (of course) fashion.

This contradicts the current opinion against optimization, based on the assumption that microprocessors are so cheap that you can do anything in software, on a standard microprocessor. But there are some things you just can't do in software, a point where clever compression techniques and scheduling algorithms give out. The ratio of processing power to I/O is just different on a multi-user server from on a pc -- and the simplest thing is to build a machine targeted for that role.

NetFrame is not alone. Unisys recently announced MicroA, a microprocessor version of its mainframe. But this system has a PC AT bus and form factor

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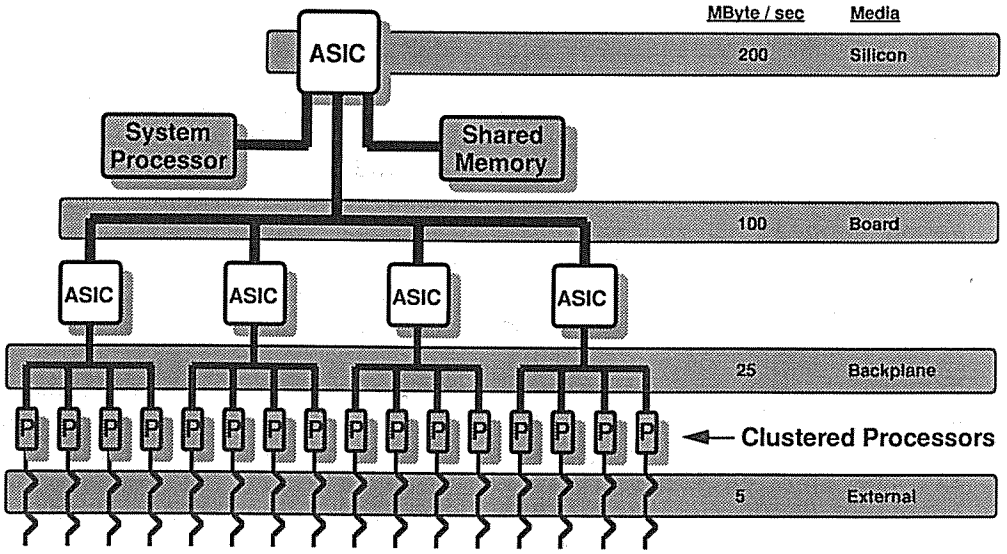
1*Software will use these records to guide its own behavior and to direct and monitor users' activities. Help screens will be tailored for particular users, or deleted after a user accomplishes a task correctly a certain number of times; woe to the "borrower" who's not as accomplished as the user he "borrows" from! Managers will get reports on the status of work they've assigned; workers will be gently guided to focus on tasks of high priority.*

and runs only Unisys MCP/AS software or DOS on a co-processor; it's aimed more at Unisys' existing customers than at the growing installed base of pcs that need something to connect them and unleash their potential power. NeXT has also packed a lot of I/O capability into its new machine with a set of proprietary chips (specifically not included in the technology licensed to IBM). But the design center for NeXT is the individual user, with a heavy emphasis on sound and display resolution (although he is assumed to be linked). NetFrame's system doesn't even *have* a screen, let alone a sound chip or a microphone. NeXT could well play client to a NetFrame server.

NetFrame is the first serious *general-purpose, server* embodiment of the client-server architecture. 3Com's 3Station is the first mass-market client embodiment; Metaphor built a decision-support system around such an architecture; Britton-Lee/Sharebase sells a special-purpose database server; and a number of companies already sell number-crunching and graphics servers (or back-ends). Perhaps the closest thing in concept is DEC's VAXcluster, for $700,000 and up, says Torresi, but it handles only 140 Mbps to NetFrame's maximum 800 Mbps, and it's less modular, lacking the equivalent of NetFrame's channel processors to handle real-time events and offload the cpus. (You wouldn't want NetFrame managing real-time operations such as firing missiles, but that's a small market compared to the one NetFrame is after.)

NetFrame's hierarchical bus structure



The planets are in line *(thanks, Vern!)*

NetFrame has $5 million in first-round financing from Kleiner Perkins, Olivetti and MK Global Ventures in its pocket. It is entering the scene just as the planets are lining up in a pattern of good auspices for the server market -- a situation Torresi saw clearly from his vantage at Businessland. Servers enhance the value of an installed base of PCs -- a multiplier effect that should appeal to many customers who have bought PCs and aren't sure of their utility. (You wouldn't hire an office worker who couldn't talk to and cooperate with other workers. Why use a pc with such a disability?) Network software abounds; OS/2 and UNIX are attracting applications such as Notes and many databases and database-based systems are on the way. The market is people who already have networks. They *know* why they need a NetFrame: Their current systems are slow and overburdened.

The only question is the same as for software groupware: Who will support this stuff? Torresi's first reseller is obvious: He left Businessland on friendly terms and remains a director. Then there are resellers of the LANs NetFrame will support -- 3Com, Novell, Banyan -- and the UNIX community. Ultimately, there will be VARs with customized software, and OEMs who will use NetFrame as a structure to support their application-specific servers for such tasks as text storage and retrieval, number-crunching, AI, and image and graphics manipulation.

Behind the difference

NetFrame has not yet published prices or specs for the system, which is due to ship by year-end after beta tests this summer. But we assume prices will start in the high teens. The system will have low- and high-end versions, measured by number of processors and suggested numbers of users supported. The low-end can work with a single 386 processor; the high-end comprises several processors and (optionally) operating systems, all managed by a system processor. It does not provide software emulation of one processor on another, but it allows for easy communication among systems and transparent use and sharing of resources by any environment that can use them.

As shown in the diagram above, the NetFrame system is modular. Its components are linked by a hierarchy of buses, from high-bandwidth shared memory for communication among closely coupled processors to regular networks and dial-up lines for communication with clients and remote peripherals. In essence, the system architecture is optimized at each level for the tradeoff between bandwidth, speed and cost. ASICs manage the memory and communication channels. Scarce resources and complex communication interfaces are not wasted communicating with peripherals or clients, but communications among processors get maximum bandwidth. Because of its modularity, the system can be expanded to emphasize either processing power or throughput, depending on user requirements, and bandwidth can be matched to these requirements, so that performance doesn't suffer as a system expands.

NetFrame's own system software works on a 386; the application processors can be a variety of processors that offer familiar environments to users and client software. The system main memory works as a virtual bus, connecting all the application processors -- any mixture (ultimately) of MIPS, SPARC, Motorola 68000 and 88000 (RISC) family, Intel 80386 or 486, specially software-configured to run in the NetFrame. The application processors communicate with each other by message-passing in shared memory -- a low-protocol-overhead approach. They also share peripheral devices managed by ASIC-based channel processors and hung off a lower-power bus.

Traditional pcs or workstations can also be attached to run applications, using the NetFrame as a file server (the approach to networking currently in general use). PCs or PS/2s and Macs, along with UNIX workstations, also attach to NetFrame as client workstations, using RS-232, SCSI and AppleTalk, as well as Ethernet and Token Ring. The software they use will be identical to the network/OS systems they use today (3Com, Novell, Banyan) or tomorrow (OS/2 LAN Manager, Advanced NetWare 386, UNIX V.4, Banyan's VINES, or IBM's AIX). Additionally, applications such as SQL Server may also be configured to run directly on NetFrame.

CLIP OBJECTS: ENABLING TECHNOLOGIES' CLIP3D

We said it just last month: "In the future, we face a more interesting [intellectual property] problem as languages become richer in content, with class libraries proliferating. While the basic syntax of an object-oriented language may be freely reused, what of its class libraries? Worse, whatever the ownership of those libraries, they are expressly created to be extended by builders of systems, who may in turn sell those systems to others..." This month, we discovered Clip3D, a set of graphical objects that vendor Enabling Technologies is protecting the simplest way it knows how: Keeping the tools to manipulate the objects proprietary.

Clip3D is a library (eight volumes, $99 each) of 3D objects that can be displayed and manipulated in a multitude of ways, with code included in each volume. (You need Enabling's Pro3D to edit or create new objects.) By contrast, most clip art to date comes as bit-map images or 2D vectors, implemented for file formats such as TIFF, PICT or encapsulated PostScript -- all 2D. Whereas a 2D image of a house may be cropped, resized, rotated or perhaps even distorted and stretched, we're still dealing with a flat image. A Clip3D house, on the other hand, is a 3D representation: You can rotate the house and see its back or its top, or its insides if it was constructed/designed that way. You can look at it from a variety of perspectives, and place it in relation to other 3D objects.

Then, you can display these scenes, specifying the locations, intensity and focus of the light sources. Using Enabling's Photofinish, you can add colored light and even reflect an environment (a 3D scenario) on the objects -- remember the metallic balls on the Mac II display when it was announced, reflecting the scene around them? Those were created on a Cray to be displayed on a Mac. An experienced user of Pro3D and Photofinish can accomplish much the same effect in a couple of hours using a Mac or enhanced PC.

Just like the Cray's output, Clip3D's and Pro3D's output can be exported for display, editing and layout in 2D by most systems as images, but they can be manipulated in 3D only with Enabling's proprietary tools and language, which work with its data structures. (Enabling's technology is equivalent to but differently implemented from RenderMan, the would-be standard launched into the public domain by Pixar.) That prevents people from taking the objects and altering them and reselling them with no revenue to Enabling -- or so Enabling Technologies chairman Joe Layng asserts.

Unlike Ashton-Tate, Enabling is asserting the proprietariness of its tools from the start, is taking care *not* to publish the language, and is discouraging third-party developers from developing anything but objects; that's equivalent to sponsoring applications but not tools or compilers in the dBASE world. Will this work? Even if they could reverse-engineer the tools -- an act of dubious legality -- few people will want to take on a company that has made its intentions as clear as Enabling has. On the other hand, this attitude may make it harder to establish the products in the market: Enabling will retain rights to the whole pie, but it may be a smaller pie.

Are they really objects?

Strictly speaking, the items created in Pro3D are graphical objects, but they are not "object-oriented." That is, the objects come in classes and

inherit their characteristics from class prototypes, but the code executed to create and manipulate them is built and executed in the standard way. In that sense they're passive objects: They are activated when a program calls on them to do something (rotate, move, etc.) but they don't take actions by themselves. They also have identities and relationships like objects: A is a block of such and such dimensions, located at certain coordinates; A is part of B. But their ability to "behave" depends on the external environment that manipulates them rather than procedures and methods attached to the objects themselves. That's why they lose their power -- the proprietary 3D capabilities Enabling supplies -- when they're moved into a third-party environment. (See below.)

RELEASE 1.1: OBJECT-ORIENTED PROGRAMMING VS. OBJECT-ORIENTED DATABASES

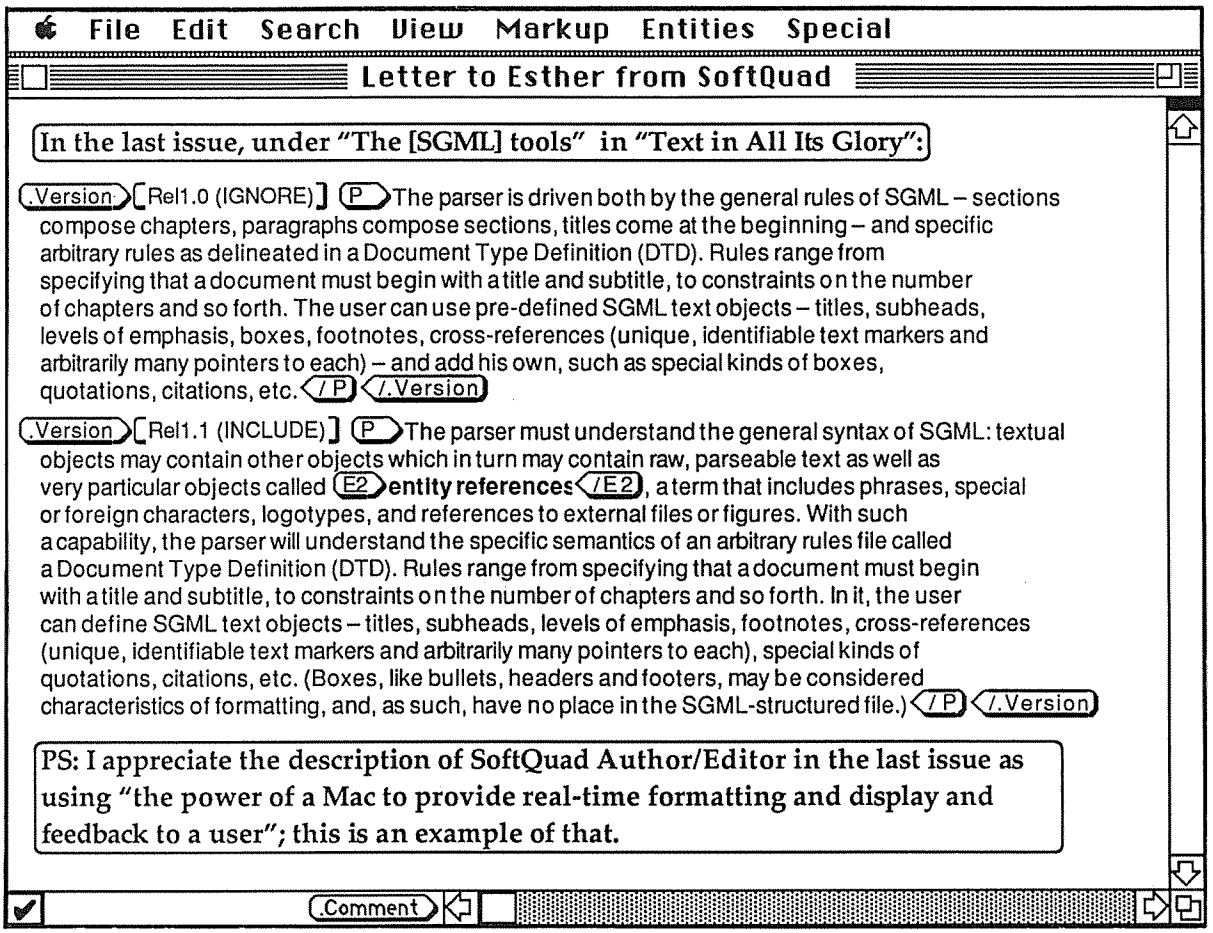
Yes, you can have object-oriented programming without object-oriented databases, and vice versa. Of course, it's much nicer to have both, but they are not inextricably linked. Object-oriented programming is about how you build programs and how code is called and executed: Does it perform linearly, with the occasional loop, subroutine call or go-to? Or do pieces of code and data send "messages" to each other in sequences that are hard to predict without actually running the system with particular data sets? That's object-oriented programming, with objects that may be loaded from a file or a relational database, or be created dynamically.

Conceivably, the objects could also come from an object-oriented database. An object-oriented database is about how objects are stored and related to one another; the relationships among objects, and possibly to inherited/shared methods or procedures, are as important as the data. A full-fledged object-oriented database also includes logic for managing transactions, integrity, etc. -- but it does not require its objects to be "active," i.e. to provide their own behavior. That's up to the objects in the database, which may or may not include their own executable code (or methods) so that they can behave in object-oriented fashion once they are loaded into the execution environment, which may or may not be object-oriented. (For the article on object-oriented databases that prompted this clarification, see Release 1.0, 88-12.)

RELEASE 1.1: FREER STYLE FROM FARALLON

Last month we wrote about Freestyle from Wang, which enables you to capture and annotate screen shots, and send them across a network or out through a fax system. One of the problems with the system is that the voice annotations require a Wang system to be heard, and they are attached to the entire screen shot rather than to selectable objects within it. Farallon, a longtime vendor of Mac-based groupware tools, has based a similar system, Annotator, on the Mac, which gives it several advantages. For starters, Annotator (not yet formally announced) can work on almost the entire installed base of Macs (412E and above), and with virtually every Mac application. Like Freestyle, it works with an image rather than the original live data file, but it handles entire files rather than a page at a time. Moreover, the Mac environment gives it the ability to annotate (voice or text or image) particular objects within a file, and to send live files with the annotations to any other Mac user. Such are the benefits of a tightly enforced homogeneous environment and a high-level least common denominator.

RELEASE 1.1: SOFTQUAD CLARIFIES SGML


File Edit Search View Markup Entities Special
Letter to Esther from SoftQuad
In the last issue, under "The [SGML] tools" in "Text in All Its Glory":
.Version [Rel1.0 (IGNORE)] P The parser is driven both by the general rules of SGML – sections compose chapters, paragraphs compose sections, titles come at the beginning – and specific arbitrary rules as delineated in a Document Type Definition (DTD). Rules range from specifying that a document must begin with a title and subtitle, to constraints on the number of chapters and so forth. The user can use pre-defined SGML text objects – titles, subheads, levels of emphasis, boxes, footnotes, cross-references (unique, identifiable text markers and arbitrarily many pointers to each) – and add his own, such as special kinds of boxes, quotations, citations, etc. /P /.Version
.Version [Rel1.1 (INCLUDE)] P The parser must understand the general syntax of SGML: textual objects may contain other objects which in turn may contain raw, parseable text as well as very particular objects called E2 entity references /E2, a term that includes phrases, special or foreign characters, logotypes, and references to external files or figures. With such a capability, the parser will understand the specific semantics of an arbitrary rules file called a Document Type Definition (DTD). Rules range from specifying that a document must begin with a title and subtitle, to constraints on the number of chapters and so forth. In it, the user can define SGML text objects – titles, subheads, levels of emphasis, footnotes, cross-references (unique, identifiable text markers and arbitrarily many pointers to each), special kinds of quotations, citations, etc. (Boxes, like bullets, headers and footers, may be considered characteristics of formatting, and, as such, have no place in the SGML-structured file.) /P /.Version
PS: I appreciate the description of SoftQuad Author/Editor in the last issue as using "the power of a Mac to provide real-time formatting and display and feedback to a user"; this is an example of that.
.Comment

RELEASE 0.5: PORT AUTHORITY

One more sign of the blossoming UNIX market: Peter Weiner, founder of Interactive Systems, the UNIX developer that built the first version of AIX for IBM and was recently acquired by Kodak, has launched a new venture, Segue Software. Segue's mission is to transfer best-selling DOS programs to UNIX platforms. The company's first project, with Peter Norton Computing, is a good example of Segue's approach. It wouldn't make sense to *port* the Norton [DOS] Utilities directly to UNIX, but it makes all the sense in the world to take those ideas and reimplement them for the UNIX environment, starting with 386-based systems. Segue will develop and market the products in conjunction with Interactive Systems, which has a well-established presence in the UNIX market.

ARTIFICIAL INTELLIGENCE AT LAST

The young computer science student approaches the lab's new supercomputer with trepidation. This one doesn't do just calculations, he's been told; it does AI. He sits at the terminal and types: "Will computers ever think like humans?" The computer pauses, and flashes a response on the screen: "You know, that question reminds me of a story...." [Go to line 1.]

1989 PERSONAL COMPUTING FORUM: GET SET FOR THE NINETIES

The 1989 Personal Computing Forum will take place from *March 19 to 22* in Palm Springs. We are now sold out and accepting waiting-list applications only, we're sorry to say. We look forward to seeing those of you already registered in Palm Springs! Your families are also welcome for all the social events.

Daphne Kis, associate publisher

Our roster of speakers is:

Tania Amochaev	Natural Language Incorporated
Gordon Bell	Ardent
John Seely Brown	Xerox PARC
Jim Cannavino	IBM Entry Systems
Vittorio Cassoni	Olivetti
John Dvorak	Himself (EDwards MC)
Bob Epstein	Sybase
Ed Esber	Ashton-Tate
Gordon Eubanks	Symantec
Bill Gates	Microsoft
Adele Goldberg	ParcPlace Systems
Bill Joy	Sun Microsystems
Philippe Kahn	Borland International
Mitchell Kapor	ON Technology
Bob Kavner	AT&T
Frank King	Lotus
Phil Pfeffer	Ingram
John Roach	Tandy
Mort Rosenthal	Corporate Software
John Sculley	Apple
Enzo Torresi	NetFrame
John Warnock	Adobe

With the first annual EDwards for EDventurous performance!

We are also arranging company/product/concept presentations by certain attendees. They include Action Technologies, Adobe, AICorp, Aion, Aldus, Avalanche, Brightbill-Roberts, Claris, Clear Software, Coordination Technology, DB/Access, Fox, Geovision, Hewlett-Packard (NewWave), Interbase, MacroMind, MapInfo, Microrim, NetFrame, NeXT, Novell, Persoft, Phoenix, Premise, Saber Software, Saros, SoftQuad, Softsel (UNIX division), Stepstone (Objective-C/NextStep), Sun Microsystems, Sybase, Tandy (DeskMate), Traveling Software (ViewLink), Verity, Wang (Freestyle), WordTech.

Desert EDventure! Stanford PhD in geophysics Colleen Barton (Larry Tesler's wife) will lead a day-long field trip exploring natural sites and a geodetic station (where they measure fault activity) on Tuesday for companions, "children" over 12 (with a parent) and miscreant attendees. (Palm Springs sits near the San Andreas fault.)

RESOURCES & PHONE NUMBERS

Steve Brightbill, **Brightbill-Roberts**, (315) 474-3400
Glenn Johnson (OSF), Myles Falvella (VAXcluster), **Digital Equipment**, (603) 881-0411, (508) 264-5986
Joe Layng, **Enabling Technologies**, (312) 427-0408 or (800) 544-0629
Reese Jones, Tom Rielly, **Farallon**, (415) 849-2331
Webb McKinney, Bob Frankenberg, **Hewlett-Packard**, (408) 773-6289, 447-1632
Jeff Mason, **IBM Advanced Workstations**, (914) 749-3250
Ron Fisher, **Interactive Systems**, (213) 453-8649
Frank King, Bill Gross, **Lotus Development**, (617) 577-8500, 225-1624
Bill Gates, Steve Ballmer, **Microsoft**, (206) 882-8080
Enzo Torresi, Carl Amdahl, **NetFrame**, (408) 745-1520
David Tory, Ira Goldstein, **Open Software Foundation**, (617) 621-8700
Adele Goldberg, **ParcPlace Systems**, (415) 859-1000
Barbara Schultz, **Peter Norton Computing**, (213) 319-2000
Peter Weiner, **Segue**, (213) 453-2161
Richard Abrahams, **SoftLogic**, (603) 627-9900
Yuri Rubinsky, **SoftQuad**, (416) 963-8337
Gus Klein, K.K. Tan, **Stepstone**, (203) 426-1875
Mark Eppley, **Traveling Software**, (206) 483-8088
Tom Mace, Peter Cunningham, **UNIX International**, (800) UI UNIX5 or (201) 263-8400 (preliminary; if they don't work, call us for the new ones!)
Jay Wettlaufer, **Visix (formerly part of AMS)**, (703) 841-6021
Alan Hart, **World Software**, (800) 962-6360 or (201) 444-3228
Fred Meyer, **Unisys**, (412) 542-6192

COMING SOON...

- *Microsoft's strategy for objects and operating systems.*
- *Visual programming languages: Modeling and simulation.*
- *A composition engine.*
- *Yield management for fun and profit.*
- *Active and passive objects.*
- *And much more... (If you know of any good examples of the categories listed above, please let us know.)*

Also, we will be traveling to the Soviet Union in April. Please let us know of any contacts over there whom we should visit.

RELEASE 1.0 CALENDAR

February 8-10 **Dexpo East** - New York City. DEC third-party vendors, mostly, with a focus on Mac-VAX integration. Sponsored by Expoconsul. Contact: Sandy Krueger, (800) 873-3976 or (609) 987-9400.

February 13-14 **LaST Frontier Conference** - Tempe, AZ. On software as intellectual property, with nine law professors thinking deeply, out loud; chaired by Milt Wessel (former counsel for ADAPSO). Sponsored by Arizona State University College of Law. Contact: Rosalind Pearlman, (602) 965-2124.

February 13-16 **DB2 product fair** - Orlando. Sponsored by The Relational Institute and Codd & Date International. With others. Contact: Joan Loeffler, (408) 268-8821.

February 14-17 ***Software development '89** - San Francisco Airport. Sponsored by Miller Freeman, with speakers including Bill Gates, Philippe Kahn, Larry Tesler, Dick Gabriel, Terry Winograd, Bjarne Stroustrup, Ed Yourdon. Contact: KoAnn Tingley, (415) 995-2471.

February 21-22 **Selling in Japan and the Pacific Rim** - Washington, DC. Sponsored by Electronic Industries Association in collaboration with IVEX International. With speakers from industry and government including Rep. Don Bonker, chairman of the International Economic Policy and Trade Subcommittee. Contact: Herb Rowe, (202) 457-4930.

February 22-23 **Image processing and document control** - New York City. Sponsored by Institute for International Research. With speakers from FileNet, Plexus, Imnet, Wang, Unisys, IBM and users such as Coopers & Lybrand, Arthur Andersen and the IRS. Contact: James Bradney, (212) 883-1770.

February 25 **Object-oriented programming with MacApp** - San Mateo, CA. A day-long seminar sponsored by Software Entrepreneurs' Forum. With Carl Nelson and others. Contact: Barbara Cass at (415) 854-7219 or Tony Meadow at (415) 644-9400.

February 27-March 1 **TechDoc Winter '89** - New Orleans. If you liked what you read about SGML in our last issue, here's how to get serious. Technical documentation and all its ramifications, including hypertext. Sponsored by Graphic Communications Association. Contact: Patti Hill, (703) 841-8160.

February 27-March 3 ***Spring Compcon** - San Francisco. With Gordon Moore, Bill Poduska, Steve Wolfram, Carver Mead. Sponsored by IEEE Computer Society. Contact: Roy Lee, (415) 294-2127.

February 28-March 2 ***UniForum** - San Francisco. Keynote by Terry Lautenbach, senior vp and gm, IBM USA. Sponsored by /usr/group. Contact: Ed Palmer, (408) 986-8840 or (800) 323-5155 or (312) 299-3131 to register.

February 28-March 2 **NetWorld** - Boston. Keynote by James Bruce, vp of information systems at MIT. Sponsored by Novell. Contact: Adam Torres, (201) 569-8542.

March 2-3 ***MacUser marketing conference** - Redwood City, CA. Sponsored by MacUser Magazine, with Mike Markkula, Nat Forbes, others. Call Bill Delaney, (415) 378-5601.

March 6-8 **The software re-engineering symposium** - Oakland, CA. Sponsored by Digital Consulting Inc. With Rich Currier, Panoramic; Charles Bachman, Eric Bush, Nick Zvegintzov, others. Contact: Dan Horgan, (508) 475-6990 or (508) 470-3880.

March 6-10 ***Fifth IEEE conference on artificial intelligence applications** - Miami. Keynote by Ray Kurzweil, plus Mark Fox, Ron Kaplan, Sanjay Mittal, Beau Sheil, Mike Stonebraker, Len Tedesco (Ford), Esther Dyson, Ted Nelson, John Clippinger. Call IEEE, (202) 371-1013, or Mark Fox, (412) 268-3832.

March 9-10 **COMPUTER ACCESS AND USE FOR DISABLED PERSONS** - Decatur, GA. A nuts-and-bolts workshop on a topic of increasing social and business impact. Do you know about recent government regulations on the topic, and how to implement qualifying products? Sponsored by Trace R&D Center (**Release 1.0**, 87-6). Call Greg Vanderheiden, (608) 262-6966.

March 13-16 **Interface** - New York City. Keynote speaker is AT&T chairman Robert Allen. Moved from Chicago. Sponsored by Interface. Call Walt Heithaus, (617) 449-6600.

March 13-17 **Seybold Seminars '89** - San Francisco. The place to be published...er, seen. Contact: Kevin Howard, (213) 457-5850.

March 13-16 **West Coast Computer Faire** - San Francisco. The traditional event. Contact: Cheryl Delgreco, (617) 449-6600.

March 19-22 ***EDventure Holdings Personal Computing Forum** - Palm Springs, CA. Sold out. See page 20 or call Daphne Kis, (212) 758-3434.

March 22-23 **Neural networks in the real world** - San Jose. Keynote by DARPA program manager Barbara Yoon. Organized by Tom Schwartz; managed by International Planning Information. Contact: Murray Disman, (415) 364-9040.

March 28-30 **Fourth CD ROM conference** - Anaheim. Sponsored by Microsoft. Contact: Sherrie Eastman, (206) 867-3305.

March 28-30 **AAAI's Spring Symposium on innovative applications of AI** - Stanford, CA. AI in many guises, including manufacturing, language, software engineering, knowledge systems, planning and search. Sponsored by AAAI. Contact: Rick Skalsky, (415) 328-3123.

March 29-31 **Visions '89** - San Diego, CA. Sponsored by ABCD, the microcomputer industry association (mostly dealers). With H-P's John Young. Contact: Deborah Keating, (312) 240-1818.

March 30-31 **Computing with adaptive neural networks** - San Francisco Airport. Sponsored by AI Expert Magazine, with editor Phil Chapnick and Ed Rosenfeld, Mark Gluck and Misha Pavel. Contact: Bill Rutledge or Anastasi Mills, (415) 995-2471.

April 3-5 **Patricia Seybold's third annual Technology Forum** - Cambridge, MA. Sponsored by Patricia Seybold's Office Computing Group. With a focus on object-oriented computing. Contact: Connie Sagona, (617) 742-1028.

April 10-13 ***Spring Comdex** - Chicago. Also including MACdex. Contact: Jane Wemyss at (617) 449-6600 or (800) 325-3330.

April 10-13 **Electronic Imaging West** - Pasadena. Sponsored by Institute for Graphic Communications. Call Richard Murray at (617) 891-1550.

April 12-14 **International markup conference** - Gmunden, Austria. Sponsored by Graphic Communications Association. Contact: Marion Elledge at (703) 841-8160.

April 17-19 **Macintosh business conference & exposition** - New York City. Sponsored by Cambridge Marketing. The Macs are coming! The first full-scale Mac trade show in the New York area. Contact: Brice Hereford, (800) 262-3378 or (617) 860-7100.

April 17-19 **NCGA '89** - Philadelphia. Sponsored by National Computer Graphics Association. Contact: Michael Weiner at (800) 225-6242 or (703) 698-9600.

April 18-20 **Connect '89** - Boston. Sponsored by Cahners Exposition Group with Larry DeBoever and Dale Kutnick. For MIS managers mostly. Contact: Dave Sell at (203) 964-0000.

April 20-21 **COMPUTER ACCESS AND USE FOR DISABLED PERSONS** - Newington, CT. See March 9. Call Greg Vanderheiden, (608) 262-6966.

April 26-28 ***Executive UniForum Symposium** - Santa Barbara, CA. Aimed at MIS executives of large end-user organizations. Sponsored jointly by Patty Seybold's Office Computing Group and /usr/group. Contact Judy Hurwitz, (617) 742-5200, or Ed Palmer, (408) 986-8840.

April 30-May 4 ***CHI '89: Conference on human factors in computing systems** - Austin. Sponsored by ACM/SIGCHI and a host of other groups. Contact: Claudia Raun, MCC, (512) 338-3798.

May 7-10 **Software Maintenance Association annual meeting** - Atlanta, GA. "Share the vision." Contact: Marietta McCanse, (602) 722-3955 or (800) 825-6622.

May 7-10	**ASM Information Systems conference** - Dallas. Keynote speeches by Dave Eskra of Pansophic and Bob Berland of IBM. Sponsored by the Association for Systems Management. Contact: Terri Gibbons, (216) 243-6900.
May 7-10	***IBM computer services and consultants executive conference** - Phoenix. Contact your IBM rep, or Charlotte Scott at (212) 745-3500.
May 9-11	**OpticalStorage89** - San Jose. Back for the fourth time by popular demand. Sponsored by DISK/TREND and Freeman Associates. Call Darlene Plamondon, (408) 554-6644.
May 9-11	**Second international conference on computer-assisted learning** - Dallas. Sponsored by U of Texas' Computer Learning Research Center. Contact: Janet Harris, (214) 690-2204.
May 14-17	***ADAPSO Management Conference/IIA Spring Conference** - San Diego. Mingle with your peers (and the zoo's nearby just in case). A joint session sponsored by ADAPSO and the Information Industry Association, with the usual round of business-focused sessions, networking and speeches by luminaries. Contact: Sheila Wakefield, (703) 522-5055.
May 15-18	**Eleventh international conference on software engineering** - Pittsburgh. Sponsored by IEEE et al. Contact: Larry Druffel, (412) 268-7740.
May 15-18	**Principles of knowledge representation and reasoning** - Toronto. Sponsored by the Canadian Society for Computational Studies of Intelligence, with AAAI and others. Contact: Raymond Reiter, (416) 978-6324.
May 21-24	***Software Publishers Association spring symposium** - San Diego. Sponsored by SPA. Keynote by Jim Manzi; also includes the Excellence in Software Awards. Contact: Jayne White, (202) 452-1600.
June 5-8	***AIIM show & conference** - San Francisco. "Discover the power of imaging." Keynote: astronaut Wally Schirra. Sponsored by the Association for Information and Image Management. Contact: James Breuer, (301) 587-8202.
June 6-8	**International expert systems conference and exhibition** - London. Sponsored by Learned Information. Contact: Jean Mulligan, (011) 44 865 730275; fax, 865 736354.
June 11-14	***Expert Communication '89** - San Francisco. Sponsored by Graphic Communications Association and chaired by Mills Davis. Contact: Norman Scharpf, (703) 841-8160.
June 12-16	**Summer USENIX technical conference** - Baltimore. Tutorials on networking, environments, development tools, window systems, etc. Contact USENIX at (213) 592-1381 or 592-3243, or John Donnelly, (303) 499-2600 (exhibits) or Neil Ground Water (703) 883-1221 (papers).

June 20-22 ***PC Expo & National CASEcon** - New York City. Sponsored by PC Expo. Call Steven Faher, (800) 444-EXPO or (201) 569-8542.

June 21-23 ***Programming language design and implementation** - Portland, OR. Sponsored by ACM SIGPLAN. Contact: Bruce Knobe, (508) 879-2960 x3376 or Knobe@S56.Prime.com.

June 25-28 **Twelfth international conference on R&D in information retrieval** - Cambridge, MA. Sponsored by ACM SIGIR and other groups. Contact: Bruce Croft, University of Massachusetts, (413) 545-0463.

June 25-28 ***Twenty-sixth Design Automation Conference** - Las Vegas. The big event for designers and vendors to designers. Sponsored by ACM. Contact: Pat Pistilli, (303) 530-4333.

July 17-21 ***CASE 89** - London. Sponsored by Index Technology and a host of academic groups, including London's Imperial College. Contact: Elliot Chikofsky, (617) 494-8200, x 1989.

July 31-August 4 ***SIGGRAPH '89** - Boston. Sponsored by the Association For Computing Machinery. The annual festival for visual, graphical thinkers. Contact Cindy Stark, (312) 644-6610.

August 1-3 **Comdex Asia/Pacific** - Sydney, Australia. Sponsored by Interface Group. Contact: Cheryl Delgreco, (617) 449-6600.

August 9-10 ***Macworld Expo** - Boston. Contact: Peggy Kilburn, (617) 326-9955.

August 9-11 ***Conference on object-oriented dbms applications** - Santa Clara, CA. Sponsored by Santa Clara University. Contact: Mohammed Ketabchi, (408) 554-2731 or mketabchi@scu.bitnet.

August 22-24 **Summer UniForum** - Boston. The regional version. Sponsored by /usr/group. Contact: Ed Palmer, (408) 986-8840.

August 22-26 ***IJCAI-89** - Detroit. The international version of AAAI. Sponsored by the American Association for Artificial Intelligence. Contact: Claudia Mazzetti, (415) 328-3123.

August 23-25 **TechDoc '89** - San Jose. "Publishing in the '90s...the art of publishing and the science of information management. Technical documentation and all its ramifications, including hypertext. Sponsored by Graphic Communications Association. Contact: Patti Hill, (703) 841-8160.

August 24-September 1 ***Eleventh World Computer Congress** - San Francisco. With a focus on tools and application software this year; in the U.S. for the first time in 24 years. Sponsored by 46 IFIP member societies. Call Nancy Dana, (303) 696-6100.

September 6-9 **Breakaway '89** - Orlando. Sponsored by ABCD, the microcomputer industry association (mostly dealers). Contact: Deborah Keating, (312) 240-1818.

September 7-10	**Comtec '89** - Singapore. The third regional microcomputer exhibition. Organized by ITP Services and the Microcomputer Trade Association Singapore. With 71,000 visitors (28,000 professional, trade or business) in 1988. Contact: Yong Mee Hiong, Singapore 2913238; fax 2965384.
September 12-14	**NetWorld** - Dallas. Managed by H.A. Bruno. Contact: Adam Torres at (201) 569-8542 or (800) 444-EXPO.
September 17-20	***Agenda 90** - La Costa, CA. Sponsored by IDC/P.C. Letter; staged by Stewart Alsop. Contact: Nanette Buckhout, (415) 592-8880.
September 18-20	**DataStorage** - San Jose. Sponsored by DISK/TREND and Freeman Associates. Call Darlene Plamondon, (408) 554-6644.
September 18-22	***Third international conference on human-computer interaction** - Boston. Sponsored by Association of American Publishers, Bechtel National, IBM, Purdue and the U. of Wisconsin-Madison. Contact: Myrna Leap, (317) 494-5426.
September 20-23	***Seybold computer publishing conference** - San Francisco. Sponsored by Seybold Publications. The usual extravaganza, expanded from desktop publishing to include all electronic publishing. Contact: Kevin Howard, (213) 457-5850.
October 1-4	***ADAPSO Management Conference** - Orlando. Mingle with your peers (and Disneyworld's nearby just in case). Sponsored by ADAPSO, and always tremendously valuable. Contact: Sheila Wakefield, (703) 522-5055.
October 2-6	**CD-ROM Expo** - Washington, DC. Sponsored by IDG Conference Group. Contact: Mitch Hall, (617) 329-8090.
October 3-5	**PC Expo** - Chicago. Sponsored by PC Expo. Contact: Steven Faher, (800) 444-EXPO or (201) 569-8542.
October 10-13	**Info 89** - New York City. Sponsored by Cahners Exposition Group. Contact: Frank Fazio, (203) 964-0000.
October 11-14	***Software Publishers Association annual conference** - Montreal. Sponsored by SPA. Call Jayne White, (202) 452-1600.
October 25-27	***SGML applications conference** - Washington, DC. Sponsored by Graphic Communications Association. Contact: Norman Scharpf, (703) 841-8160.
November 13-17	***Comdex** - Las Vegas. Also including MACdex. Contact: Jane Wemyss at (617) 449-6600 or (800) 325-3330.

Please let us know about any other events we should include.
-- Denise DuBois

**The asterisks indicate events we plan to attend. Lack of an asterisk is no indication of lack of merit.*

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Associate Publisher